Museum of La Rochelle, by P. J. Van Beneden.—On some uniform geometric transformations, by C. Le Paige.—Second notice on the comet, by F. Terby.—On the functions of M. Prym and M. Hermite, by A. Genocchi.—On glycogen in Mucorineæ, by L. Errera.

Journal de Physique, December, 1882.—Remarks on timbre, by M. Kœnig.—Remarks on the critical state, by M. Stolatow.—Experimental study of the reflection of actinic rays; influence of specular polish, by M de Chardonnet.—Note on the theory of the Laurent saccharimeter with white light, by M. Dufet.—Notes of science in *Il Nuovo Cimento* and the *Journal* of the Russian Physico-Chemical Society.

Rivista Scientifico-Industriale e Giornale del Naturalista, October 31, and November 15 and 30, 1882.—Inconveniences of the usual pluviometer, and a few words about the pluviopulverometer, an apparatus for rain, dew, and atmospheric dust, by P. Lancetta.—Non-sensitive mercury thermometer; demonstration of the principle of the telephone, by G. Govi.—A doe with hairy horns.—Review of a prize memoir by G. Poloni, on the permanent magnetism of steel at different temperatures, by A. W.—Double-action mercury air-pump, by G. Serraville.—Fundamental principle of electrostatics, by S. Mugna.—Male genital armatures of saltatory Orthoptera, by A. Tozzetti.—Brief notice of the fluoriferous volcanoes of Campania, by A. Scacchi.

Reale Istituto Lombardo di Scienze e Lettere. Rendiconti. Vol. xxv., fasc. xviii.—On a recent landslip near Belluno, by T. Taramelli.—On drunkenness in Milan, II., by A. Verga.—Jacobi's theorem regarding periodicity, and the illegitimacy of a part of the consequnces that have been deduced from it, by F. Casorati.

Nouveaux Mémoires de la Société Helvetique des Sciences Naturelles, vol. xxviii., 2nd part.—The Diluvium round Paris and its position in the Pleistocene, by A. Rothpletz.

SOCIETIES AND ACADEMIES

LONDON

Mathematical Society, January 11.—Prof. Henrici, F.R.S., president, in the chair.—Messrs. H. T. Gerrans and W. L. Mollison were elected members.—Dr. Hirst, F.R.S., spoke on the resolution of congruences into systems of quadric reguli; Mr. Glaisher, F.R.S., discussed the solution of a differential equation allied to Riccati's; and Mr. Tucker communicated a paper by Prof. Cayley, F.R.S., on the automorphic transformation of a binary cubic function.

Zoological Society, December 19, 1882.—Prof. W. H. Flower, LL.D., F.R.S., president, in the chair.—Mr. Sclater exhibited some photographs of a new Zebra, from Shoa, lately named *Equus grevyi*, by M. A. Milne-Edwards, F.M.Z.S., which had been sent to him by that gentleman, and pointed out the difference which separated this animal from the nearly allied *E. zebra*.—The Rev. H. H. Slater, F.Z.S., exhibited and made remarks on the skin of a Shrike (*Lanius* sp. inc.) which had been obtained near Spurn Point, Yorkshire.—The Secretary exhibited, on behalf of Lord Lilford, the skin of a young male *Emberiza rustica*, which had been taken at Elstree Reservoir on November 19 last. Only one other example of this bird had hitherto been recorded as having been met with in Great Britain.—Dr. Günther exhibited, on behalf of Sir Campbell Orde, Bart., a specimen of a Charr (*Salmo alpinus*), obtained in a loch in North Uist, being the first example ever obtained in this loch.—Mr. P. H. Carpenter exhibited and made remarks on some microscopical preparations of *Antedon eschrichti*, in which a nervous plexus derived from the fibrillar envelope of the chambered organ was visible at the sides of the ambulacra of the disk.—Prof. Flower exhibited a photograph (presented to the Society by Mr. James Farmer, F.Z.S.) of Seal Point, Farallone Islands, off the coast of California, showing the immense number of Seals (*Otaria gillespii*, M'Bain) frequenting that locality.—Prof. Flower read a paper on the whales of the genus *Hyperoodon*, in which he pointed out that one of the most important points in the history of these animals yet unsolved was whether the large-headed form, with great development of the maxillary crests, called by Dr. J. E. Gray *Lagenocetus latifrons*, was a distinct species, or whether, as suspected by Eschricht, it was the adult male of the common form known as *Hyperoodon rostratus*. The author had asked Capt. David Gray to avail himself of his exceptionally favourable opportunities of observing these animals in their native haunts, to solve this question, with the result shown in the next communication.—A communication was read from Capt. David Gray, ss. *Eclipse*, called "Notes on the Characters and Habits of the Bottlenose Whale (*Hyperodoon*)," in which it was stated that he had killed 203 of these animals last season, and had traced in the males every gradation of development between the two forms, and had therefore conclusively proved that *Hyperoodon* or *Lagenocetus latifrons* had no existence as a distinct species. The communication was illustrated by sketches and photographs, showing the external characters and cranium in various stages of growth.—Mr. P. H. Carpenter read a paper on the classification of the *Comatulæ*. He criticised the method of formulation recently proposed by Prof. F. J. Bell, and pointed out its disadvantages for the purposes of classification, owing to its being inapplicable to those *Comatulæ* which have irregular arm-divisions. He explained his own system of formulation and classification, and stated that he believed it to be capable of dealing with all possible variations of *Comætula* structure.—Mr. F. Day read a paper on the identity of *Arnoglossus lophotes*, Gthr., with *Pleuronectes grohmanni*, Bonap. A second paper by Mr. Day contained remarks on some hybrids between Salmon and Trout.—A paper by Messrs. Godman and Salvin was read, describing some Butterflies from New Ireland, received from the Rev. G. Brown and Mr. E. L. Layard. Among these were examples of two new species, named respectively *Prothoe layardi* and *Danaius adustus*.—Mr. Oldfield Thomas read a paper containing descriptions of two new species of Fruit-Bats of the genus *Pteropus* from the Caroline Islands. The author proposed to call them *Pteropus phæocephalus* and *Pt. breviceps*.—A communication was read from Major G. F. L. Marshall, F.Z.S., containing some notes on Asiatic Butterflies. A species of *Amecera* was mentioned as new to the Beluchistan fauna, and three species were described as new to science.—Mr. G. A. Boulenger read the description of a new species of Lizard from Dacotah, based upon some specimens lately presented to the Society's collection by Mr. S. Garman, of the Museum of Comparative Zoology, Cambridge, Mass., and proposed to name it *Sceloporus garmani*.—Mr. Arthur G. Butler read a paper in which he gave an account of a collection of Spiders made by the Rev. Deans Cowan in Madagascar. In addition to many inteesting and singular forms were specimens of the curious tailed species *Arachnoura scorpionoides* from Central Madagascar. Six new species were described.—Mr. W. N. Parker read a paper on some points in the anatomy of the Indian Tapir.—Mr. Herbert Druce read a paper descriptive of new species of Moths chiefly from Western Africa and New Guinea. Fifteen new species were described, as was also a new genus of *Chalcosiidæ* from New Guinea.

Geological Society, December 20, 1882.—J. W. Hulke, F.R.S., president, in the chair.—Percival Fowler, Alfred Eley Preston, and Robert Blake White, were elected Fellows of the Society.—The following communications were read:—On generic characters in the order Sauropterygia, by Prof. Owen, C.B., F.R.S. After referring to the subdivision of De La Beche's group of Enaliosauria into the orders Ichthyopterygia and Sauropterygia, the author indicated that the latter showed differences in the proportional length of the neck and the number and form of its vertebræ bearing relation to the size of the head, together with modifications of the teeth, of the sterno-coraco-scapular frame and of the paddle-bones, leading to the formation of two genera, namely, *Plesiosaurus* and *Pliosaurus*, the latter so-called to indicate the nearer approach made by it to a generalised Saurian type. In Crocodilia the crowns of the teeth show a pair of strong enamel ridges, placed on opposite sides of the teeth, and these occur also in *Pliosaurus;* while in *Plesiosaurus* they are not present. *Pliosaurus* further approaches the fresh-water Saurians by the large size of the head and the shortness of the neck.—On the origin of valley-lakes, mainly with reference to the lakes of the Northern Alps, by the Rev. A. Irving, B.A., B.Sc., F.G.S. The author, having given reasons for considering this question, still an open one, proceeded to criticise Prof. Ramsay's theory as it was expounded by him in 1862. The author proceeded to show that the lakes of the Northern Alps are found, as a rule, just among those strata where subsidence would be most likely to occur. In this way it was shown that we are *not shut up*, by Prof. Ramsay's reasoning, to the hypothesis of *glacial excavation*. Further, other agencies than those discussed by Prof. Ramsay may have co-operated to form lakes, such as (*a*) *Alterations in the relative levels* of different parts of a floor of a valley, connected with movements of parts of a mountain-system on a large scale. The effects of (1) lines of flexure crossing older lines of valley-erosion; (2) of lateral thrusts closing in a valley (partly), were here considered. (*b*) *Upthrust* of the more yielding strata (as in the "creeps" of coal-mines) by resolution of forces due to pressure of the mountain-masses at the side of a valley. (*c*) The *dead weight of the huge glaciers* which filled the Alpine valleys, and *crushed in the floor*, in places where extensive underground erosion had gone on in preglacial times. (*d*) The partial *damming up of valleys*, (1) by *diluvial detritus*, (2) by *moraines*, (3) by *Bergstürze* (recently investigated by Prof. Heim of Zürich. (*e*) *Faults*. (*f*) *Chemical solution*, by Alpine waters derived from the melting of the snow, which has undergone long exposure to the atmosphere. It was shown that the very situation of the great majority of the lakes of the Northern Alps is distinctly favourable to the operation of one or more of these agencies. The Königsee was mentioned as a special instance of *subsidence;* the Achensee of a lake lying in a *faulted* line of dislocation; Lake Alleghe and Lake Derborence as lakes formed by Bergstürze during the last century; the prehistoric delta of the Arve as the most conspicuous instance in the Alps of the partial damming-up of a valley by diluvial detritus; the *quondam* Lake of Reutte as an instance connected with violent inversion of strata; and the ancient lakes of the Grödner and Oetz Thals as instances of the action of moraines. The common fact of observation that lakes are more numerous in glaciated than in non-glaciated countries, the author thought, was partly explained by some of the foregoing principles, partly by the better preservation of lake-basins in glaciated countries from silting up and from becoming thus obliterated, while in some glaciated regions lakes are wanting.

Victoria (Philosophical) Institute, January 15.—Prof. Stokes, F.R.S., Lucasian Professor of Mathematics at Cambridge, read a paper on the Absence of Real Opposition between Science and Religion.

EDINBURGH

Royal Society, December 18, 1882.—Mr. Robert Gray, vice-president, in the chair.—Prof. Tait read a paper on the laws of motion, in which an attempt was made to express the fundamental principles of dynamics without introducing the idea of "force." The conservation of energy forms of course the basis. The region of space, in which a given particle is, is mapped out by its equipotential surfaces. Newton's First Law is expressed, then, by saying that the potential of the space is the same from point to point, so that the kinetic energy of a moving particle suffers no change. If the potential varies, then the kinetic energy must vary. As a simple case, consider two regions separated by a plane, the potential function being constant throughout each region. Then the velocity of a particle approaching the plane may (since motion is purely relative) be referred to a point moving parallel to the plane, so as to make the velocity of the particle wholly perpendicular to the plane. It thus appears that the component of the velocity at right angles to the plane only is altered, so that if the direction of motion is originally inclined to the plane, the direction as well as the speed is altered. This, in fact, is the well known problem of refraction according to the corpuscular theory of light; and the principle of least action thus appears under the form of the conservation of velocity at right angles to the direction of greatest potential slope. In expressing Newton's Third Law, Prof. Tait extended the second interpretation as given in the now well known Scholium to include vector as well as scalar quantities.—Mr. George Seton, in a paper on illegitimacy in Scotland, gave a careful analysis of the returns for the last decade, which showed a decrease of ·9 per cent. as compared with the returns of the previous decade. The counties in which the percentage was under the average for the whole country all lay to the west of a line drawn from the north coast to Loch Ryan, down the eastern boundaries of Sutherland, Inverness, Perth, Argyle, Renfrew, and Ayr. That this difference could not be referred as altogether due to difference of race was proved by the fact that amongst the pure Scandinavian population of Orkney and Shetland the rate was much below the average. The results pointed to a low moral tone in the agricultural districts of Elgin, Banff, Aberdeen, Roxburgh, and Galloway.—Prof. Tait communicated an account of Prof. J. E. MacGregor's experiments on the absorption of low radiant heat by some gaseous and vaporous bodies. The apparatus was a gigantic form of that which has already been described in these columns (see NATURE, vol. xxvi. p. 639). Air saturated with water vapour at 12° C. behaved almost exactly like air mixed with ·06 per cent. by volume of olefiant gas.—Prof. Tait, in a note on the compressibility of water, stated that water seemed to be less compressible at higher than at lower pressures, and more compressible (as compared with steel or glass) at lower than at higher temperatures. This latter result was obtained by comparison of his own laboratory experiments with the experiments carried out by Mr. Murray and Prof. Chrystal in their deep-sea sounding expedition last summer on the north-west coast of Scotland. Both series of experiments were made with Prof Tait's steel and glass gauges.—Prof. Crum Brown communicated a note by Mr. A. P. Laurie on an application of Mendeljeff's law to the heats of combination of the elements with the halogens. Laying off as abscissæ numbers representing the heats of combination of different salts of a given halogen, and measuring as ordinates the corresponding atomic weights of the other element in the compound, Mr. Laurie obtains a succession of points which show a remarkable periodic arrangement. The curves so drawn for the different halogens are strikingly similar.

PARIS

Academy of Sciences, January 8.—M. Blanchard in the chair.—The following papers were read:—Observations on the last communication of Dr. Siemens concerning solar energy, by M. Faye.—On the ice-plant (*Mesembrianthemum crystallinum*), by M. Mangon. This plant (which is covered with transparent vesicles filled with liquid, like frozen dew-drops) is formed of a weak solution of alkaline salt, kept in the solid state by a vegetable tissue, whose weight reaches less than two per cent. of the whole mass. The ashes, formed of salts of soda and potash, constitute nearly half (43 per cent.) the weight of the dried plant (recalling seaweed). M. Mangon notes the plant's elective power, suggests that its cultivation, as a potash-plant, might be useful in some cases, and in any case, it might do good service in removal of alkaline salts in excess from ground on the Mediterranean coast.—Researches on hyponitrites; second part; calorimetric measurements, by MM. Berthelot and Ogier.—On the natural formation of bioxide of manganese, and on some reactions of peroxides, by M. Berthelot.—Experiments relating to disorders of motility caused by lesions of the apparatus of hearing, by M. Vulpian. He describes a series of disorderly movements produced in rabbits by pouring a few drops of hydrate of chloral solution into one ear or both ears. The same experiment with dogs and guinea-pigs gave much less marked effects.—On complex units, by M. Kronecker.—Examination of the analogy between electrochemical and hydrodynamical rings, and the curves $\Delta V = 0$; Best process of discussions in the experimental method, by M. Ledieu.—Experiments on the motion of current waves in various passages, contracted either in the interior or at the extremity of a canal debouching into a reservoir, by M. de Caligny.—Report on a memoir of M. de Salvert on conic umbilici.—On the precision of longitudes determined with use of the new chronometric method, by M. de Magnac. He shows by a list of chronometric longitudes obtained in the *Jean Bart*, on the coast of Brazil and Montevideo, compared with the telegraphic longitudes deduced from observations by three American officers, that the difference is remarkably small.—A case of damage to a building from lightning was reported; the effect was attributed to breaks in certain metallic parts (there was a good lightning-rod and there were trees near).—The periodicity of comets, by M. Zenger. He finds the origin of comets intimately connected with the rotation of the sun. Dividing the intervals of times of perihelion by various whole numbers, he obtains a mean value of 12·56 days, which is exactly that of a demi-rotation of the sun. Thus, between successive formations of comets there must have elapsed an even or odd number of solar demi-rotations. He supposes enormous explosions driving far out the matter of protuberances; large meteorites near the outer border of the corona may thereby be enabled to agglomerate coronal matter round them and form a comet. The general law of motions of planets applies equally to comets. but the duration of revolution of comets must be a multiple of that of a half-rotation of the sun.—Addition to a note on prime numbers, by Mr Lipschitz.—Influence of cooling on the value of maximum pressures developed in closed vessels by explosive gases, by M. Vieille.—Remarks on the expression of electric magnitudes in the electrostatic and electromagnetic systems, and on the relations deduced from it, by MM. Mercadier and Vaschy.—

Phosphorography of the infra-red region of the solar spectrum; wave-lengths of the principal lines, by M. Becquerel. He gives a determination of new lines of the solar spectrum and their wave-length, [and he has observed in the infra-red spectrum, maxima and minima of extinction proper to different phosphorescent substances manifested by various luminous sources, and similar to phosphorogenic maxima and minima in the other end of the spectrum.—On solar photometry, by M. Crova. Correcting a numerical error, he obtains 8,500 carcels for the sun's luminous intensity in a clear sky, and so removes the inexplicable discordance of his former figures with those of Bouguer and Wollaston.—Manganese in dolomitic strata; origin of the nitric acid, which often exists in natural bioxides of manganese, by M. Dieulafait. There are two classes of ores of manganese; those of the first class are directly derived from action of sea-water on primordial rocks, and they are deposited but a short distance from their place of extraction. Those of the second class have been, since the origin of seas, in complete solution in their waters, and have been deposited at all epochs, where chemical conditions have been favourable.—On the existence of the genus *Todea* in Jurassic strata, by M. Renault.—On a trombe observed at sea, by M. de Tromelin.—A work by Prof. Inostranzeff, of St. Petersburg, "On the prehistoric man of the stone age of Lake Ladoga," was presented by M. Daubrée.

BERLIN

Physical Society, January 5.—Prof. Helmholtz in the chair.—Prof. Spörer, of Potsdam, first communicated the results of an investigation of the sun-spot observations in the twenty years, 1861 to 1880, with a view to settlement of the question whether movements of the spots indicated surface-currents on the sun. It appeared that such currents, towards the pole, or towards the equator, were not demonstrable. Herr Spörer further spoke at length on a quite peculiar phenomenon he had noticed on observing the transit of Venus on December 6. He premised that the phenomenon might be explained in two ways; either it might be regarded as an effect of fatigue or over-stimulation of the eye (though he had not marked other signs of such exhaustion), or it might be connected with a very cloudy atmosphere of Venus, whose presence is supposed to be indicated by the glow which some astronomers have seen to extend along the Venus-crescent over the whole planet. The phenomenon itself was as follows: the transit of Venus was observed in Potsdam with a 10-foot telescope; the sunlight was reduced to a degree of brightness bearable by the eye by means of a polarising arrangement (two pairs of parallel mirrors). The sun's limb was much agitated, and the first contact could not be observed. When the planet had made a distinct indentation on the sun, it was considerably blacker than the ground of the heavens; and the part of the planet lying outside the sun was invisible. After more than half the disc had entered the sun, it was observed that the borders of the black-planet disc was still at right angles to the sun's border, and the two sun-points were absent. Later, when Venus was further advanced, the whole disc, and even the small part lying outside, appeared brighter than the ground of the heavens, and with a dull grey light. Another minute later a small interrupted line having previously been seen outwards and upwards from the planet's disc, on the ground of the heavens, there appeared, out from the grey disc, a dark crescent-shaped segment, which, above and below, was distinctly defined, and in the middle merged indefinitely in the similarly coloured ground of the heavens. The grey disc with the dark crescent advanced on the sun, so that it was not possible to distinguish precisely the planet's disc. At about 3h. 11¼m. the outer border of the grey disc was in the connecting line of the two solar horns, and so in the first internal contact; one minute later, an alteration (not more exactly describable) had occurred in the aspect of the planet's disc, and about 3h. 13¼m., at the time of the previously-calculated first internal contact, the outer border of the dark segment had entered; one saw a fine luminous line on the sun without black drop. One minute later the sun disappeared behind a bank of clouds.—Dr. Herz communicated the results of calculations he had made with a view to answering the question, whether the tidal action of the moon is capable of producing currents of water-masses on the earth of such an order of magnitude, that the ocean-currents observed might be explained by this cause. Proceeding on the assumption of a water channel running round the equator, he found for liquids with friction, that the tide must indeed produce a current; and for a whole series of such channels reaching from the equator to the pole there appeared currents, which in their co-operation would present the form of the great ocean currents, but their order of magnitude was such, on the assumption at the outset, that the actual ocean currents cannot be due to this cause. Herr Herz then, conversely, calculated from the astronomically-proved retardation of the earth's rotation, the tangential force, which can produce such a retardation, and determined the differences of the water-levels on the east and west coast of a very narrow dividing ridge of land, which would produce such a pull; these differences of level were deducible from the tidal action of the moon.—Prof. Ostwald, from Riga, reported, on his experiments for measurement of the chemical forces of affinity. As is usual in physics, he measured these forces by mass and velocity of the reactions, or by the force with which equilibrium is maintained. Two acids were each brought into contact with a base, and the salts formed were determined; in all cases, the affinities were found proportional to the reacting mass and the square of the velocity of the reaction. The formula construtecd a few years ago by Herren Guldberg and Wage for affinity, has been confirmed by the author by numerous experiments.

VIENNA

Imperial Academy of Sciences, November 30, 1882.—V. Hausmaninger, on the variability of the coefficient of diffusion between carbonic acid and air.—P. Kowalewsky, on the relation of the nucleus lentiformis to the cortex of brain in man and animals.—V. Hilber, on recent land-snails and land-snails found in the loess from China (part 1), containing a description of Helix species collected by L. v. Loczy during the Asiatic Expedition of Count Szecheniji. E. Stefan, on the experiments made by Boltzmann on sound-vibrations.

December 7, 1882.—V. v. Lang, on his capillary balance.—H. Niederriss, on trimelhene-glycol and the bases of tiimelhene.

December 14, 1882.—F. Streintz, on the usefulness of the method of Fuchs.—Tg. Klemencic, on the capacity of a plate-condenser.—A Wassmuth, on the internal connection of some electro-magnetic phenomena resulting from the mechanical theory of heat.—V. Gruber, fundamental experiment on the cutaneous sight of animals.—G. Vortmann, on the separation of nickel from cobalt.—R. Canaval, on the earthquake at Gmünd (Austria) on November 5, 1881.—E. Weiss, communication on the observations of the transit of Venus in Austria.—H. Weidel and M. Russo, studies on pyridine.

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